

Mesocyclops ogunnus Onabamiro 1957 (Crustacea: Copepoda: Cyclopoida): First report for northeastern Brazil

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ABSTRACT: *Mesocyclops ogunnus* is a copepod originally recorded in Africa and Asia, being considered an invader species in reservoirs in the Americas. The present work records its occurrence in northeastern Brazil for the first time. This species was collected in the Três Lagoas region in the city of João Pessoa, State of Paraíba, Brazil, which increases its geographical distribution beyond the central-western, southeastern and southern regions of the country.

The genus *Mesocyclops* Sars, 1914, is included in the family *Cyclopidae* and currently comprises 71 species (Holynska 2000), being one of the most diversified and successful genera of cyclopoid copepods found in continental waters (Silva 2008; Van de Velde 1984). Most species of this genus are found in subtropical (Holynska 2006; Holynska and Brown 2003) and inter-tropical zones, as for example of the African species (Mouelhi *et al.* 2000).

According to Gutierrez-Aguirre and Suárez-Morales (2001) 21 species and subspecies of the genus *Mesocyclops* have been described for the neotropical region; and of these, 15 have been reported to Brazil: *M. annulatus* Wierzejski, 1892; *M. annulatus diversus* Herbst, 1962; *M. aspericornis* Daday, 1906; *M. brasilianus* Kiefer, 1933; *M. ellipticus* Kiefer, 1936; *M. finitimus* Silva, 1989; *M. kieferi* Van de Velde, 1984; *M. leuckarti* Claus, 1857; *M. longisetus* Thiébaud, 1912; *M. longisetus curvatus* Dussart, 1987; *M. longisetus longisetus* Thiebaud, 1914; *M. meridianus* Kiefer, 1926; *M. meridionalis* Dussart and Frutos, 1985; *M. ogunnus* Onabamiro, 1957; and *M. paranaensis* Dussart and Frutos, 1985 (Lansac-tôha *et al.* 2002; Matsumura-Tundisi and Silva 2002; Rocha and Botelho 1998).

Mesocyclops ogunnus has been originally recorded in the African-Asian region (Holynska 2000; Van de Velde 1984) but has been subsequently observed on other continents, probably due to invasion events. In the African continent, this species has been reported in Nigeria (Onabamiro 1957; Oronsaye 2008), Tunisia (Mouelhi *et al.* 2000), Benin, Egypt, Ivory Coast, Senegal, Burkina Faso, Kenya, Mali, Mauritania, Mozambique, Chad, South Africa, and Ethiopia (Van de Velde 1984). Mouelhi *et al.* (2000) cited records of this species in Asia in: Israel, Bangladesh, Uzbekistan, Laos, Sri Lanka, Philippines, Vietnam and China. It also has been reported in the Americas in Florida (Hribar and Reid 2008), Central America (Suárez-Morales *et al.* 2004), and Brazil (Reid and Pinto-Coelho 1994).

In Brazil, this species has been found in the central-western, southeastern and southern regions of the country in the States of Mato Grosso do Sul, São Paulo, Minas Gerais,

and Paraná (González *et al.* 2008; Lansac-tôha *et al.* 2002; Matsumura-Tundisi and Silva 2002; Peixoto *et al.* 2010; Santos-Wisniewski and Rocha 2007; Silva 2011) (Figure 1). The first report of this species to Brazil, as *M. ogunnus*, was in 1993 in the Furnas reservoir in the southern part of the State of Minas Gerais (Hribar and Reid 2008; Reid and Pinto-Coelho 1994). According to Matsumura-Tundisi and Silva (2002) this species was described erroneously in the São Paulo State as *M. kieferi* in some surveys (Nogueira 2001; Tundisi and Matsumura-Tundisi 1994). In a posterior work Matsumura-Tundisi and Silva (2002) corrected its identification to *M. ogunnus*.

Mesocyclops ogunnus has a history of relatively recent invasions in Brazil (Hribar and Reid 2008; Lansac-tôha *et al.* 2002) and, according to Matsumura-Tundisi and Silva (2002) and Reid and Pinto-Coelho (1994), this species may have been introduced into the Furnas reservoir with stocks of tilapias fish (*Oreochromis niloticus* Linnaeus, 1758) imported from Africa. The tilapias were first introduced in Brazil in the 70 and 80 decades, by Departamento Nacional de Obras Contra a Seca (DNOCS) in the State of Ceará (region northeast) and by hydroelectric companies in the

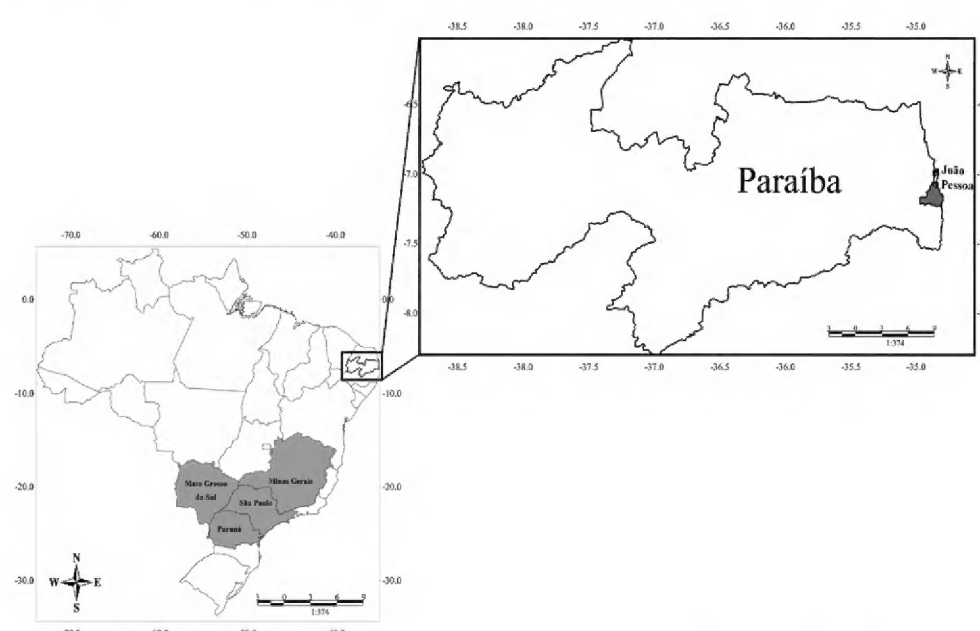


FIGURE 1. Geographical distribution of *M. ogunnus* in Brazil. The shaded areas represent previous reports of the species according to the literature. Expanded area represent the local of the new record of the specie for the northeastern region of the country (João Pessoa, State of Paraíba).

States of São Paulo and Minas Gerais (regions south and southeast) (Simões *et al.* 2007). However, Reid and Pinto Coelho (1994) pointed out that “the means of introduction of some copepod species, as in the case of *M. ogunnus* and *M. kieferi*, remain even more a matter for speculation.”

This species has been found to be dominant in eutrophic reservoirs (Matsumura-Tundisi and Tundisi 2005; Peixoto *et al.* 2010) where it was generally associated with macrophytes (Lansac-tôha *et al.* 2002). Although *M. ogunnus* is commonly associated with fresh water, it can also be found in salt or brackish water environments; this characteristic appears to be one of the adaptative factors that has contributed to the dispersal of this organism to many different environments (Bonou *et al.* 1991; Guo 2000a; Guo 2000b; Van de Velde 1984).

The present records are the first occurrence of *M. ogunnus* in northeastern Brazil. Specimens were collected in May of 2009 in Três Lagoas (7°9'56.54" S and 34°53'44.51" W) in the western part of João Pessoa, State of Paraíba. The sampling were held performing horizontal hauls along the margins using a zooplankton net (100 µm mesh size). Immediately after collection, the samples were preserved in 3% formaldehyde. The specimens (Figure 2) were registered (UFPB.CRUST – 2397) and deposited in the Laboratório de Invertebrados Paulo Young (LIPY) at the Universidade Federal da Paraíba (UFPB).

Some of the main diagnostic characteristics of *M. ogunnus* are the presence of a row of spines on the maxillular palp, fifth pediger with many lateral spines and few dorsal spines, absence of internal spines in the caudal ramus (Figure 3 A-B). Other characteristics are basipodite of the antenna ornamented by a row of spines in the distal portion, leg 4 basipodite with 2 groups of long slender spines on its posteromedial surface, and leg 4 endopodite article with 3 terminal spines subequal in length and spinulate along most of their margins (Van de Velde 1984). and the seminal receptacle with broad horizontal lateral arms and long curve pore-canal (Figure 3 C-D) (Jeje 1988; Reid and Pinto-Coelho 1994). Therefore the characteristics of the specimens collected were compatible with the diagnosis of the species.



FIGURE 2. Female of *M. ogunnus* with two egg sacks. Photo: C. Liberal.

This report of *M. ogunnus* for the northeastern region of Brazil (State of Paraíba) represents an important increase in the distribution of this species and a strong indication of the capacity of this copepod species to invade Neotropical ecosystems. The relevance of this report is related to the importance of possible impacts of this copepod on local ecosystems.

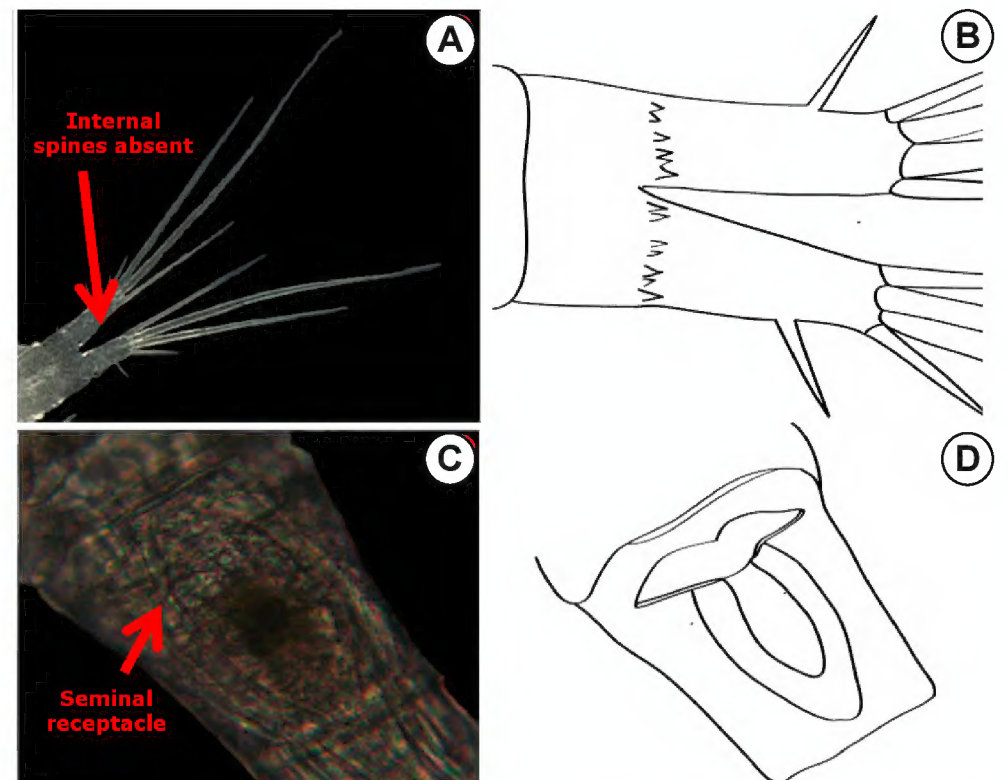


FIGURE 3. (A - B) Detail of the caudal ramus. (D - C) Detail of seminal receptacle.

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